

Image Analogies

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Analogies



Image analogies

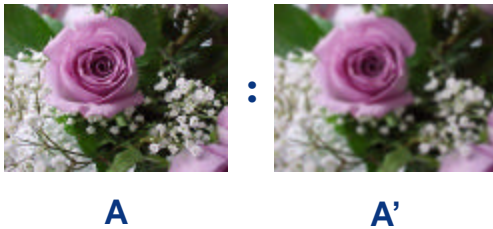


Image analogies

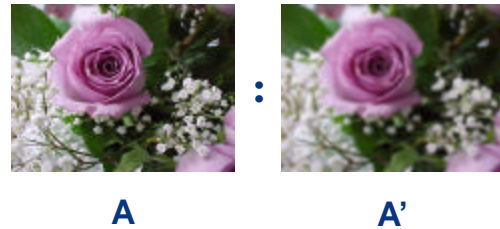


Image analogies



Motivation

Design by example

One mechanism, many filters

Problems

No unique transformation

What aspects of the images are important?

Applications

Texture synthesis

Applications

Texture synthesis

Superresolution

Applications

Texture synthesis

Superresolution

Texture transfer

Applications

Texture synthesis

Superresolution

Texture transfer

Artistic filters

Applications

Texture synthesis

Superresolution

Texture transfer

Artistic filters

Texture-by-numbers

Related work

Machine learning for graphics

Related work

Machine learning for graphics
Texture synthesis and transfer

Related work

Machine learning for graphics
Texture synthesis and transfer
Non-photorealistic rendering

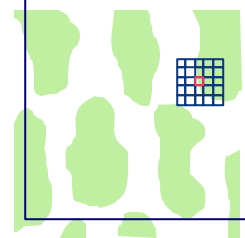
Related work

Machine learning for graphics
Texture synthesis
Non-photorealistic rendering
Example-based NPR

Algorithm

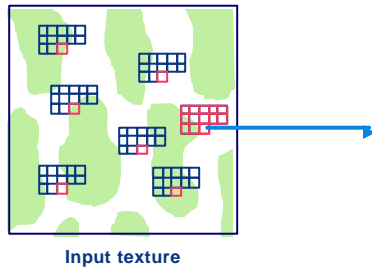
Texture synthesis

Goal: Match image statistics

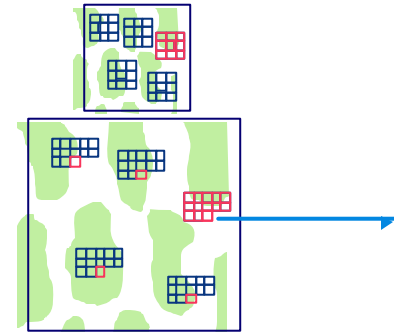


Input texture

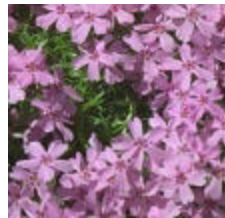
Texture synthesis (Efros 99)



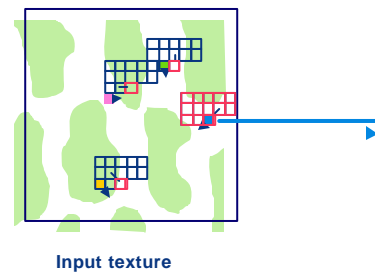
Multiscale synthesis (Wei 00)



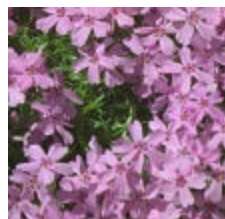
Multiscale synthesis



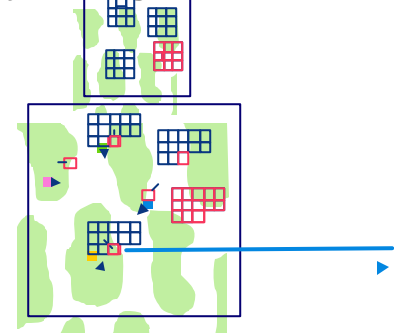
Coherent synthesis (Ashikhmin 01)



Coherent synthesis



New, hybrid algorithm



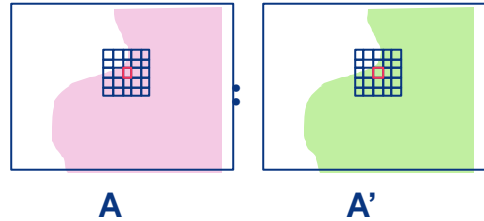
Combined algorithm



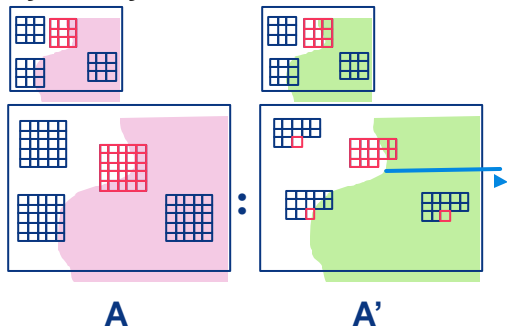
Input texture

Image analogies

Goal: Match *joint* image statistics



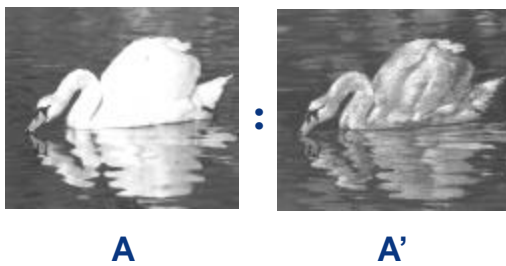
Hybrid synthesis



Feature vectors

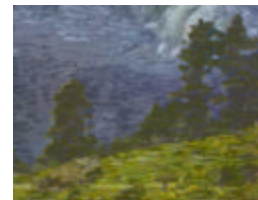


Feature vectors

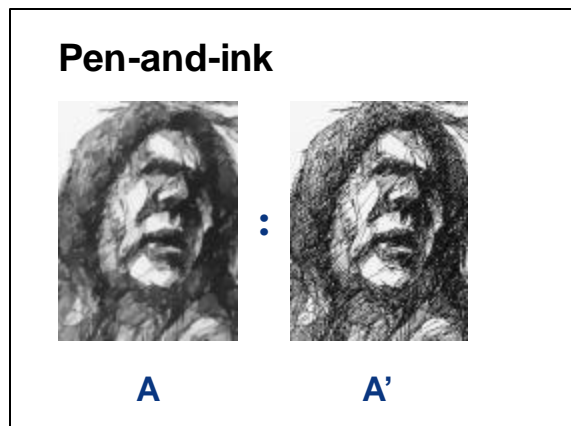
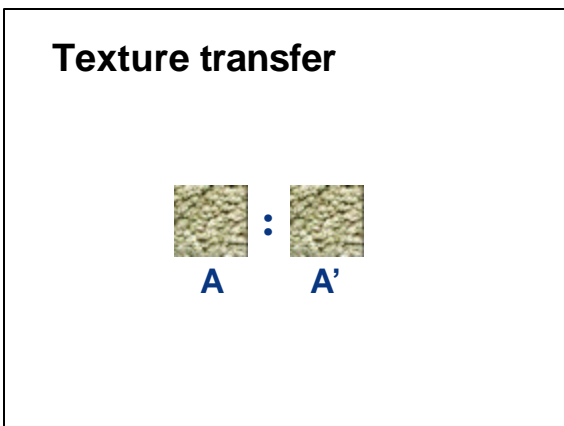
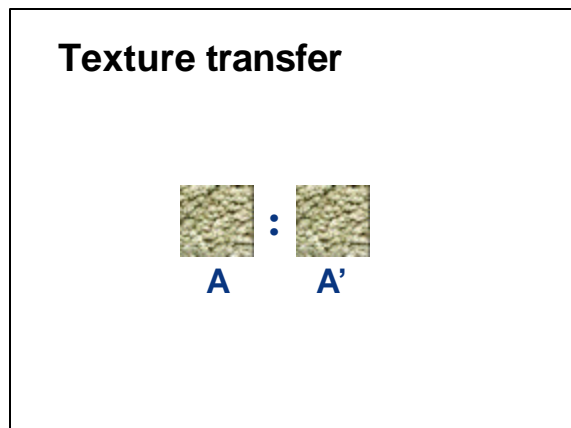
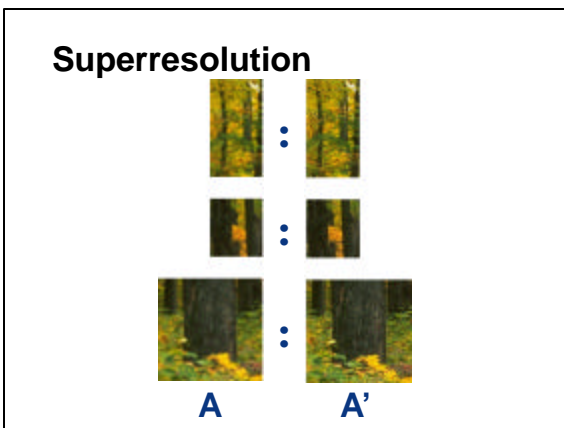
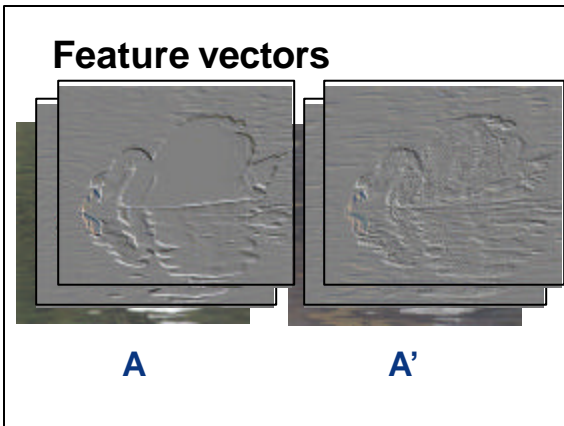


Color

Combine new luminance with source color B



B' (Final)



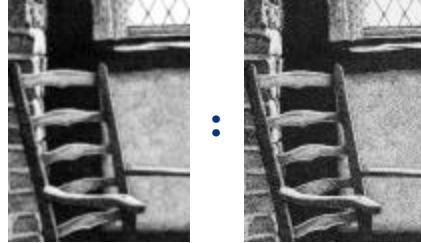
Pen-and-ink



A

A'

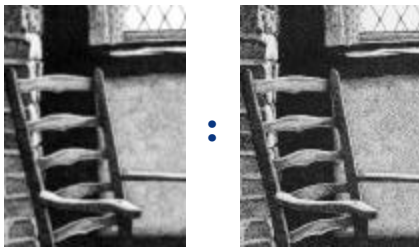
Stippling



A

A'

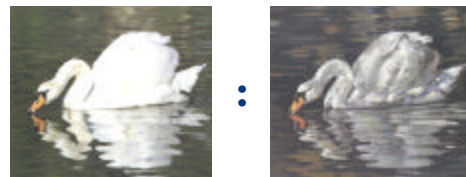
Stippling



A

A'

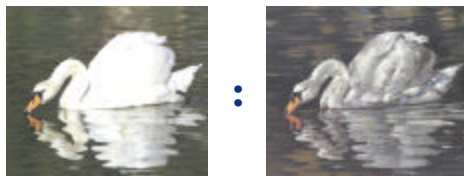
Pastel



A

A'

Pastel



A

A'

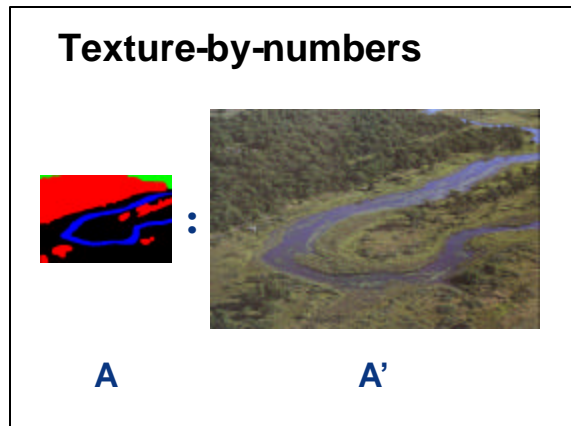
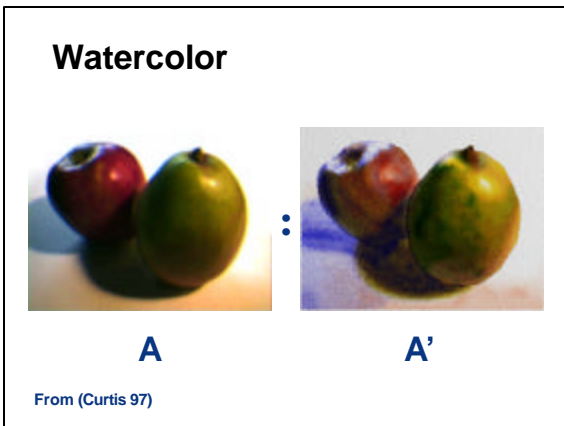
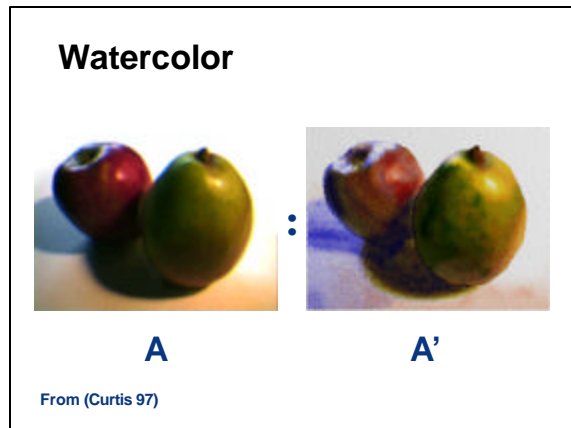
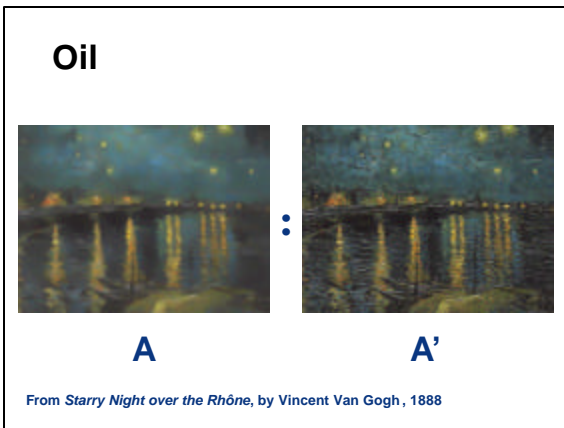
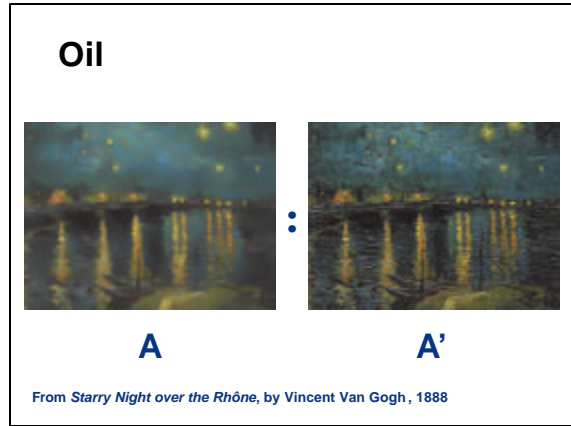
Oil



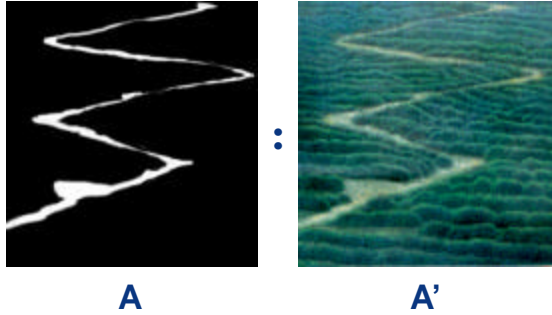
A

A'

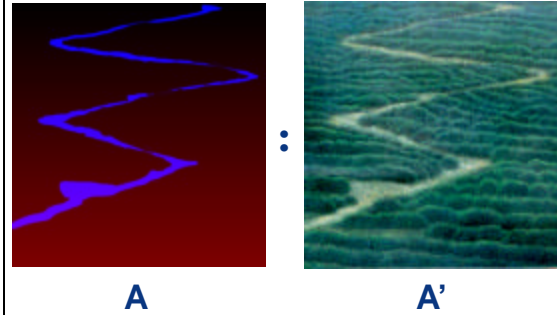
From *Still life with Melon and Peaches*, Edouard Manet, 1866



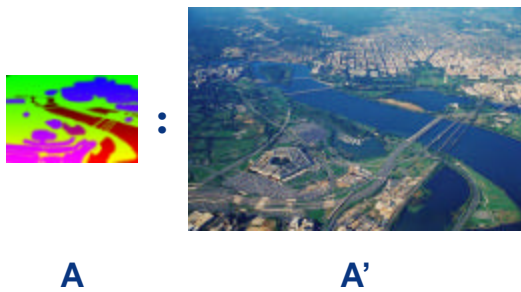
Texture-by-numbers



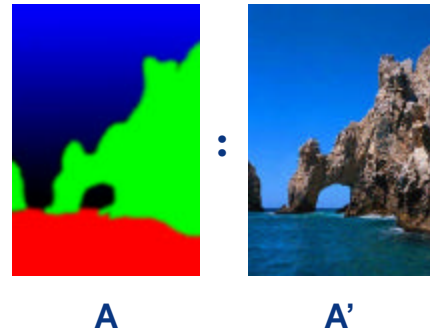
Texture-by-numbers



Texture-by-numbers



Interactive editor



Future work

Algorithms

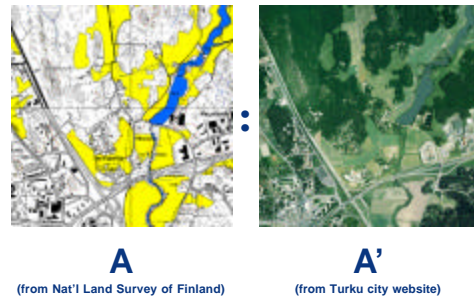
- Better color space matching
- Faster synthesis
- Better regression

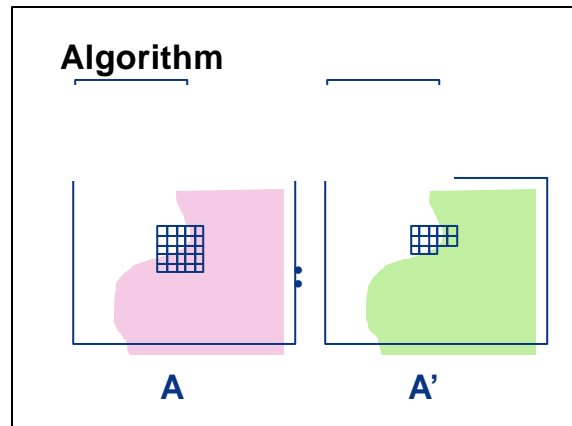
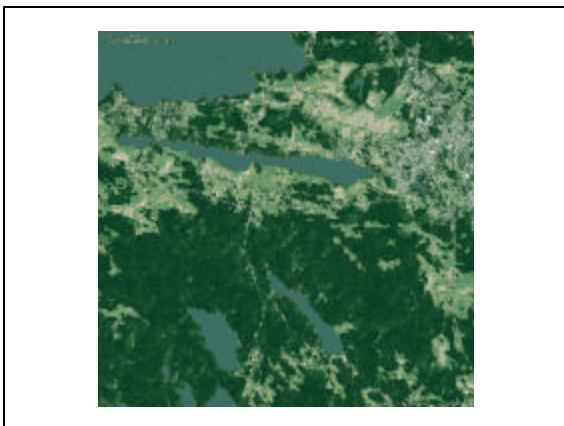
Applications

- Video, 3D, animation, ...

Flight simulator terrain

by Jari Kaskelin (jari.kaskelin@luukku.com)





Color

Combine new intensity with source color

Grayscale B' (Y) B (IQ) Final B'